VII. COMPLIANCE AND ENFORCEMENT HISTORY

Background

Until recently, EPA has focused much of its attention on measuring compliance with specific environmental statutes. This approach allows the Agency to track compliance with the Clean Air Act, the Resource Conservation and Recovery Act, the Clean Water Act, and other environmental statutes. Within the last several years, the Agency has begun to supplement single-media compliance indicators with facility-specific, multimedia indicators of compliance. In doing so, EPA is in a better position to track compliance with all statutes at the facility level, and within specific industrial sectors.

A major step in building the capacity to compile multimedia data for industrial sectors was the creation of EPA's Integrated Data for Enforcement Analysis (IDEA) system. IDEA has the capacity to "read into" the Agency's single-media databases, extract compliance records, and match the records to individual facilities. The IDEA system can match Air, Water, Waste, Toxics/Pesticides/EPCRA, TRI, and Enforcement Docket records for a given facility, and generate a list of historical permit, inspection, and enforcement activity. IDEA also has the capability to analyze data by geographic area and corporate holder. As the capacity to generate multimedia compliance data improves, EPA will make available more in-depth compliance and enforcement information. Additionally, sector-specific measures of success for compliance assistance efforts are under development.

Compliance and Enforcement Profile Description

Using inspection, violation and enforcement data from the IDEA system, this section provides information regarding the historical compliance and enforcement activity of this sector. In order to mirror the facility universe reported in the Toxic Chemical Profile, the data reported within this section consists of records only from the TRI reporting universe. With this decision, the selection criteria are consistent across sectors with certain exceptions. For the sectors that do not normally report to the TRI program, data have been provided from EPA's Facility Indexing System (FINDS) which tracks facilities in all media databases. Please note, in this section, EPA does not attempt to define the actual number of facilities that fall within each sector. Instead, the section portrays the records of a subset of facilities within the sector that are well defined within EPA databases.

As a check on the relative size of the full sector universe, most notebooks contain an estimated number of facilities within the sector according to the Bureau of Census (See Section II). With sectors dominated by small

businesses, such as metal finishers and printers, the reporting universe within the EPA databases may be small in comparison to Census data. However, the group selected for inclusion in this data analysis section should be consistent with this sector's general make-up.

Following this introduction is a list defining each data column presented within this section. These values represent a retrospective summary of inspections and enforcement actions, and reflect solely EPA, State, and local compliance assurance activities that have been entered into EPA databases. To identify any changes in trends, the EPA ran two data queries, one for the past five calendar years (April 1, 1992 to March 31, 1997) and the other for the most recent twelve-month period (April 1, 1996 to March 31, 1997). The five-year analysis gives an average level of activity for that period for comparison to the more recent activity.

Because most inspections focus on single-media requirements, the data queries presented in this section are taken from single media databases. These databases do not provide data on whether inspections are state/local or EPA-led. However, the table breaking down the universe of violations does give the reader a crude measurement of the EPA's and states' efforts within each media program. The presented data illustrate the variations across EPA Regions for certain sectors.[4] This variation may be attributable to state/local data entry variations, specific geographic concentrations, proximity to population centers, sensitive ecosystems, highly toxic chemicals used in production, or historical noncompliance. Hence, the exhibited data do not rank regional performance or necessarily reflect which regions may have the most compliance problems.

Compliance and Enforcement Data Definitions

General Definitions

Facility Indexing System (FINDS) -- this system assigns a common facility number to EPA single-media permit records. The FINDS identification number allows EPA to compile and review all permit, compliance, enforcement and pollutant release data for any given regulated facility.

Integrated Data for Enforcement Analysis (IDEA) -- is a data integration system that can retrieve information from the major EPA program office databases. IDEA uses the FINDS identification number to link separate data

[4] EPA Regions include the following states: I (CT, MA, ME, RI, NH, VT); II (NJ, NY, PR, VI); III (DC, DE, MD, PA, VA, WV); IV (AL, FL, GA, KY, MS, NC, SC, TN); V (IL, IN, MI, MN, OH, WI); VI (AR, LA, NM, OK, TX); VII (IA, KS, MO, NE); VIII (CO, MT, ND, SD, UT, WY); IX (AZ, CA, HI, NV, Pacific Trust Territories); X (AK, ID, OR, WA).

records from EPA's databases. This allows retrieval of records from across media or statutes for any given facility, thus creating a **?**master list" of records for that facility. Some of the data systems accessible through IDEA are: AIRS (Air Facility Indexing and Retrieval System, Office of Air and Radiation), PCS (Permit Compliance System, Office of Water), RCRIS (Resource Conservation and Recovery Information System, Office of Solid Waste), NCDB (National Compliance Data Base, Office of Prevention, Pesticides, and Toxic Substances), CERCLIS (Comprehensive Environmental and Liability Information System, Superfund), and TRIS (Toxic Release Inventory System). IDEA also contains information from outside sources such as Dun and Bradstreet and the Occupational Safety and Health Administration (OSHA). Most data queries displayed in notebook sections IV and VII were conducted using IDEA.

Data Table Column Heading Definitions

Facilities in Search -- are based on the universe of TRI reporters within the listed SIC code range. For industries not covered under TRI reporting requirements (metal mining, nonmetallic mineral mining, electric power generation, ground transportation, water transportation, and dry cleaning), or industries in which only a very small fraction of facilities report to TRI (e.g., printing), the notebook uses the FINDS universe for executing data queries. The SIC code range selected for each search is defined by each notebook's selected SIC code coverage described in Section II.

Facilities Inspected --- indicates the level of EPA and state agency inspections for the facilities in this data search. These values show what percentage of the facility universe is inspected in a one-year or five-year period.

Number of Inspections -- measures the total number of inspections conducted in this sector. An inspection event is counted each time it is entered into a single media database.

Average Time Between Inspections -- provides an average length of time, expressed in months, between compliance inspections at a facility within the defined universe.

Facilities with One or More Enforcement Actions -- expresses the number of facilities that were the subject of at least one enforcement action within the defined time period. This category is broken down further into federal and state actions. Data are obtained for administrative, civil/judicial, and criminal enforcement actions. Administrative actions include Notices of Violation (NOVs). A facility with multiple enforcement actions is only counted once in this column, e.g., a facility with 3 enforcement actions counts as 1 facility.

Total Enforcement Actions -- describes the total number of enforcement actions identified for an industrial sector across all environmental statutes. A facility with multiple enforcement actions is counted multiple times, e.g., a facility with 3 enforcement actions counts as 3.

State Lead Actions -- shows what percentage of the total enforcement actions are taken by state and local environmental agencies. Varying levels of use by states of EPA data systems may limit the volume of actions recorded as state enforcement activity. Some states extensively report enforcement activities into EPA data systems, while other states may use their own data systems.

Federal Lead Actions -- shows what percentage of the total enforcement actions are taken by the United States Environmental Protection Agency. This value includes referrals from state agencies. Many of these actions result from coordinated or joint state/federal efforts.

Enforcement to Inspection Rate -- is a ratio of enforcement actions to inspections, and is presented for comparative purposes only. This ratio is a rough indicator of the relationship between inspections and enforcement. It relates the number of enforcement actions and the number of inspections that occurred within the one-year or five-year period. This ratio includes the inspections and enforcement actions reported under the Clean Water Act (CWA), the Clean Air Act (CAA) and the Resource Conservation and Recovery Act (RCRA). Inspections and actions from the TSCA/FIFRA/ EPCRA database are not factored into this ratio because most of the actions taken under these programs are not the result of facility inspections. Also, this ratio does not account for enforcement actions arising from non-inspection compliance monitoring activities (e.g., self-reported water discharges) that can result in enforcement action within the CAA, CWA, and RCRA.

Facilities with One or More Violations Identified -- indicates the percentage of inspected facilities having a violation identified in one of the following data categories: In Violation or Significant Violation Status (CAA); Reportable Noncompliance, Current Year Noncompliance, Significant Noncompliance (CWA); Noncompliance and Significant Noncompliance (FIFRA, TSCA, and EPCRA); Unresolved Violation and Unresolved High Priority Violation (RCRA). The values presented for this column reflect the extent of noncompliance within the measured time frame, but do not distinguish between the severity of the noncompliance. Violation status may be a precursor to an enforcement action, but does not necessarily indicate that an enforcement action will occur.

Media Breakdown of Enforcement Actions and Inspections -- four columns identify the proportion of total inspections and enforcement actions within EPA Air, Water, Waste, and FIFRA/TSCA/EPCRA databases. Each column is a percentage of either the **?**Total Inspections," or the **?**Total Actions" column.

VII.A. Metal Casting Industry Compliance History

Table 15 provides an overview of the reported compliance and enforcement data for the metal casting industry over the past five years (April 1992 to April 1997). These data are also broken out by EPA Regions thereby permitting geographical comparisons. A few points evident from the data are listed below.

- Almost 80 percent of metal casting facility inspections and 63 percent of enforcement actions occurred in Regions III, IV, and V, where most facilities (68 percent) are located.

- Region X had a high ratio of enforcement to inspections (0.40) compared to other Regions.

- Region IX had a significantly higher average time between inspections (70 months), which means that fewer inspections were carried out in relation to the number of facilities in the Region (54 facilities and 40 inspections).

- Region IV had the shortest average time between inspections (9 months), but also had the lowest rate of enforcement actions to inspections of any Region (0.05).

Table 15: Five-Year Enforcement and Compliance Summary for the Metal Casting Industry

A	B	C	D	E	F	G	H	I	J
Region	**Facilities in Search**	**Facilities Inspected**	**Number of Inspections**	**Average Months Between Inspections**	**Facilities with 1 or More Enforcement Actions**	**Total Enforcement Actions**	**Percent State Lead Actions**	**Percent Federal Lead Actions**	**Enforcement to Inspection Rate**
I	15	8	44	20	2	3	67%	33%	0.07
II	26	16	128	12	10	19	68%	32%	0.15
III	74	61	458	10	19	29	83%	17%	0.06
IV	77	53	505	9	12	24	88%	12%	0.05
V	307	191	1,026	18	45	68	63%	37%	0.07
VI	44	25	103	26	6	14	43%	57%	0.14
VII	40	33	167	14	6	10	30%	70%	0.06
VIII	9	7	16	34	2	2	100%	0%	0.13
IX	54	15	46	70	4	5	100%	0%	0.11
X	23	15	42	33	7	17	94%	6%	0.40
TOTAL	669	424	2,535	16	113	191	71%	29%	0.08

VII.B. Comparison of Enforcement Activity Between Selected Industries

Tables 16 and 17 allow the compliance history of the metal casting sector to be compared to the other industries covered by the industry sector notebooks. Comparisons between Tables 16 and 17 permit the identification of trends in compliance and enforcement records of the various industries by comparing data covering the last five years (April 1992 to April 1997) to that of the past year (April 1996 to April 1997). Some points evident from the data are listed below.

- Over the past year, the industry has had one of the highest proportions of facilities inspected with violations (103 percent) and enforcement actions (10 percent).

- Over the past year, the average enforcement to inspection rate for the metal casting industry has decreased to 0.06 compared to 0.08 over the past five years.

- Of the sectors listed, facilities in the metal casting sector had one of the highest proportions of federal-lead enforcement actions (29 percent).

Tables 18 and 19 provide a more in-depth comparison between the metal casting industry and other sectors by breaking out the compliance and enforcement data by environmental statute. As in the previous Tables (Tables 16 and 17), the data cover the last five years (Table 18) and the last one year (Table 19) to facilitate the identification of recent trends. A few points evident from the data are listed below.

- The percentage of inspections carried out under each environmental statute has changed little over the past five years compared to the past year. Inspections under CAA account for the majority (about 60 percent) followed by RCRA and CWA.

- The percentage of CAA enforcement actions increased from 44 percent over the past five years to 58 percent over the past year. In addition, the percentage of enforcement actions carried under FIFRA/TSCA/EPCRA/Other decreased from 14 percent to 0 percent while CWA and RCRA remained about the same.

Table 16: Five-Year Enforcement and Compliance Summary for Selected Industries

A	B	C	D	E	F	G	H	I	J
Industry Sector	**Facilities in Search**	**Facilities Inspected**	**Number of Inspections**	**Average Months Between Inspections**	**Facilities with 1 or More Enforcement Actions**	**Total Enforcement Actions**	**Percent State Lead Actions**	**Percent Federal Lead Actions**	**Enforcement to Inspection Rate**
Metal Mining	1,232	378	1,600	46	63	111	53%	47%	0.07
Coal Mining	3,256	741	3,748	52	88	132	89%	11%	0.04
Oil and Gas Extraction	4,676	1,902	6,071	46	149	309	79%	21%	0.05
Non-Metallic Mineral Mining	5,256	2,803	12,826	25	385	622	77%	23%	0.05
Textiles	355	267	1,465	15	53	83	90%	10%	0.06
Lumber and Wood	712	473	2,767	15	134	265	70%	30%	0.10
Furniture	499	386	2,379	13	65	91	81%	19%	0.04
Pulp and Paper	484	430	4,630	6	150	478	80%	20%	0.10
Printing	5,862	2,092	7,691	46	238	428	88%	12%	0.06
Inorganic Chemicals	441	286	3,087	9	89	235	74%	26%	0.08
Resins and Manmade Fibers	329	263	2,430	8	93	219	76%	24%	0.09
Pharmaceuticals	164	129	1,201	8	35	122	80%	20%	0.10
Organic Chemicals	425	355	4,294	6	153	468	65%	35%	0.11
Agricultural Chemicals	263	164	1,293	12	47	102	74%	26%	0.08
Petroleum Refining	156	148	3,081	3	124	763	68%	32%	0.25
Rubber and Plastic	1,818	981	4,383	25	178	276	82%	18%	0.06
Stone, Clay, Glass and Concrete	615	388	3,474	11	97	277	75%	25%	0.08
Iron and Steel	349	275	4,476	5	121	305	71%	29%	0.07
Metal Castings	**669**	**424**	**2,535**	**16**	**113**	**191**	**71%**	**29%**	**0.08**
Nonferrous Metals	203	161	1,640	7	68	174	78%	22%	0.11
Fabricated Metal Products	2,906	1,858	7,914	22	365	600	75%	25%	0.08
Electronics	1,250	863	4,500	17	150	251	80%	20%	0.06
Automobile Assembly	1,260	927	5,912	13	253	413	82%	18%	0.07
Shipbuilding and Repair	44	37	243	9	20	32	84%	16%	0.13
Ground Transportation	7,786	3,263	12,904	36	375	774	84%	16%	0.06
Water Transportation	514	192	816	38	36	70	61%	39%	0.09
Air Transportation	444	231	973	27	48	97	88%	12%	0.10
Fossil Fuel Electric Power	3,270	2,166	14,210	14	403	789	76%	24%	0.06
Dry Cleaning	6,063	2,360	3,813	95	55	66	95%	5%	0.02

Table 17: One-Year Enforcement and Compliance Summary for Selected Industries

A	B	C	D	E		F		G	H
				Facilities with 1 or More Violations		Facilities with 1 or more Enforcement Actions			
Industry Sector	Facilities in Search	Facilities Inspected	Number of Inspections	Number	Percent*	Number	Percent*	Total Enforcement Actions	Enforcement to Inspection Rate
Metal Mining	1,232	142	211	102	72%	9	6%	10	0.05
Coal Mining	3,256	362	765	90	25%	20	6%	22	0.03
Oil and Gas Extraction	4,676	874	1,173	127	15%	26	3%	34	0.03
Non-Metallic Mineral Mining	5,256	1,481	2,451	384	26%	73	5%	91	0.04
Textiles	355	172	295	96	56%	10	6%	12	0.04
Lumber and Wood	712	279	507	192	69%	44	16%	52	0.10
Furniture	499	254	459	136	54%	9	4%	11	0.02
Pulp and Paper	484	317	788	248	78%	43	14%	74	0.09
Printing	5,862	892	1,363	577	65%	28	3%	53	0.04
Inorganic Chemicals	441	200	548	155	78%	19	10%	31	0.06
Resins and Manmade Fibers	329	173	419	152	88%	26	15%	36	0.09
Pharmaceuticals	164	80	209	84	105%	8	10%	14	0.07
Organic Chemicals	425	259	837	243	94%	42	16%	56	0.07
Agricultural Chemicals	263	105	206	102	97%	5	5%	11	0.05
Petroleum Refining	156	132	565	129	98%	58	44%	132	0.23
Rubber and Plastic	1,818	466	791	389	83%	33	7%	41	0.05
Stone, Clay, Glass and Concrete	615	255	678	151	59%	19	7%	27	0.04
Iron and Steel	349	197	866	174	88%	22	11%	34	0.04
Metal Castings	**669**	**234**	**433**	**240**	**103%**	**24**	**10%**	**26**	**0.06**
Nonferrous Metals	203	108	310	98	91%	17	16%	28	0.09
Fabricated Metal	2,906	849	1,377	796	94%	63	7%	83	0.06
Electronics	1,250	420	780	402	96%	27	6%	43	0.06
Automobile Assembly	1,260	507	1,058	431	85%	35	7%	47	0.04
Shipbuilding and Repair	44	22	51	19	86%	3	14%	4	0.08
Ground Transportation	7,786	1,585	2,499	681	43%	85	5%	103	0.04
Water Transportation	514	84	141	53	63%	10	12%	11	0.08
Air Transportation	444	96	151	69	72%	8	8%	12	0.08
Fossil Fuel Electric Power	3,270	1,318	2,430	804	61%	100	8%	135	0.06
Dry Cleaning	6,063	1,234	1,436	314	25%	12	1%	16	0.01

**Percentages in Columns E and F are based on the number of facilities inspected (Column C). Percentages can exceed 100% because violations and actions can occur without a facility inspection.*

Table 18: Five-Year Inspection and Enforcement Summary by Statute for Selected Industries

Industry Sector	Facilities Inspected	Total Inspections	Total Enforcement Actions	Clean Air Act		Clean Water Act		RCRA		FIFRA/TSCA/ EPCRA/Other	
				% of Total Inspections	% of Total Actions	% of Total Inspections	% of Total Actions	% of Total Inspections	% of Total Actions	% of Total Inspections	% of Total Actions
Metal Mining	378	1,600	111	39%	19%	52%	52%	8%	12%	1%	17%
Coal Mining	741	3,748	132	57%	64%	38%	28%	4%	8%	1%	1%
Oil and Gas Extraction	1,902	6,071	309	75%	65%	16%	14%	8%	18%	0%	3%
Non-Metallic Mineral Mining	2,803	12,826	622	83%	81%	14%	13%	3%	4%	0%	3%
Textiles	267	1,465	83	58%	54%	22%	25%	18%	14%	2%	6%
Lumber and Wood	473	2,767	265	49%	47%	6%	6%	44%	31%	1%	16%
Furniture	386	2,379	91	62%	42%	3%	0%	34%	43%	1%	14%
Pulp and Paper	430	4,630	478	51%	59%	32%	28%	15%	10%	2%	4%
Printing	2,092	7,691	428	60%	64%	5%	3%	35%	29%	1%	4%
Inorganic Chemicals	286	3,087	235	38%	44%	27%	21%	34%	30%	1%	5%
Resins and Manmade Fibers	263	2,430	219	35%	43%	23%	28%	38%	23%	4%	6%
Pharmaceuticals	129	1,201	122	35%	49%	15%	25%	45%	20%	5%	5%
Organic Chemicals	355	4,294	468	37%	42%	16%	25%	44%	28%	4%	6%
Agricultural Chemicals	164	1,293	102	43%	39%	24%	20%	28%	30%	5%	11%
Petroleum Refining	148	3,081	763	42%	59%	20%	13%	36%	21%	2%	7%
Rubber and Plastic	981	4,383	276	51%	44%	12%	11%	35%	34%	2%	11%
Stone, Clay, Glass and Concrete	388	3,474	277	56%	57%	13%	9%	31%	30%	1%	4%
Iron and Steel	275	4,476	305	45%	35%	26%	26%	28%	31%	1%	8%
Metal Castings	**424**	**2,535**	**191**	**55%**	**44%**	**11%**	**10%**	**32%**	**31%**	**2%**	**14%**
Nonferrous Metals	161	1,640	174	48%	43%	18%	17%	33%	31%	1%	10%
Fabricated Metal	1,858	7,914	600	40%	33%	12%	11%	45%	43%	2%	13%
Electronics	863	4,500	251	38%	32%	13%	11%	47%	50%	2%	7%
Automobile Assembly	927	5,912	413	47%	39%	8%	9%	43%	43%	2%	9%
Shipbuilding and Repair	37	243	32	39%	25%	14%	25%	42%	47%	5%	3%
Ground Transportation	3,263	12,904	774	59%	41%	12%	11%	29%	45%	1%	3%
Water Transportation	192	816	70	39%	29%	23%	34%	37%	33%	1%	4%
Air Transportation	231	973	97	25%	32%	27%	20%	48%	48%	0%	0%
Fossil Fuel Electric Power	2,166	14,210	789	57%	59%	32%	26%	11%	10%	1%	5%
Dry Cleaning	2,360	3,813	66	56%	23%	3%	6%	41%	71%	0%	0%

Table 19: One-Year Inspection and Enforcement Summary by Statute for Selected Industries

Industry Sector	Facilities Inspected	Total Inspections	Total Enforcement Actions	Clean Air Act		Clean Water Act		RCRA		FIFRA/TSCA/ EPCRA/Other	
				% of Total Inspections	% of Total Actions	% of Total Inspections	% of Total Actions	% of Total Inspections	% of Total Actions	% of Total Inspections	% of Total Actions
Metal Mining	142	211	10	52%	0%	40%	40%	8%	30%	0%	30%
Coal Mining	362	765	22	56%	82%	40%	14%	4%	5%	0%	0%
Oil and Gas Extraction	874	1,173	34	82%	68%	10%	9%	9%	24%	0%	0%
Non-Metallic Mineral Mining	1,481	2,451	91	87%	89%	10%	9%	3%	2%	0%	0%
Textiles	172	295	12	66%	75%	17%	17%	17%	8%	0%	0%
Lumber and Wood	279	507	52	51%	30%	6%	5%	44%	25%	0%	40%
Furniture	254	459	11	66%	45%	2%	0%	32%	45%	0%	9%
Pulp and Paper	317	788	74	54%	73%	32%	19%	14%	7%	0%	1%
Printing	892	1,363	53	63%	77%	4%	0%	33%	23%	0%	0%
Inorganic Chemicals	200	548	31	35%	59%	26%	9%	39%	25%	0%	6%
Resins and Manmade Fibers	173	419	36	38%	51%	24%	38%	38%	5%	0%	5%
Pharmaceuticals	80	209	14	43%	71%	11%	14%	45%	14%	0%	0%
Organic Chemicals	259	837	56	40%	54%	13%	13%	47%	34%	0%	0%
Agricultural Chemicals	105	206	11	48%	55%	22%	0%	30%	36%	0%	9%
Petroleum Refining	132	565	132	49%	67%	17%	8%	34%	15%	0%	10%
Rubber and Plastic	466	791	41	55%	64%	10%	13%	35%	23%	0%	0%
Stone, Clay, Glass and Concrete	255	678	27	62%	63%	10%	7%	28%	30%	0%	0%
Iron and Steel	197	866	34	52%	47%	23%	29%	26%	24%	0%	0%
Metal Castings	**234**	**433**	**26**	**60%**	**58%**	**10%**	**8%**	**30%**	**35%**	**0%**	**0%**
Nonferrous Metals	108	310	28	44%	43%	15%	20%	41%	30%	0%	7%
Fabricated Metal	849	1,377	83	46%	41%	11%	2%	43%	57%	0%	0%
Electronics	420	780	43	44%	37%	14%	5%	43%	53%	0%	5%
Automobile Assembly	507	1,058	47	53%	47%	7%	6%	41%	47%	0%	0%
Shipbuilding and Repair	22	51	4	54%	0%	11%	50%	35%	50%	0%	0%
Ground Transportation	1,585	2,499	103	64%	46%	11%	10%	26%	44%	0%	1%
Water Transportation	84	141	11	38%	9%	24%	36%	38%	45%	0%	9%
Air Transportation	96	151	12	28%	33%	15%	42%	57%	25%	0%	0%
Fossil Fuel Electric Power	1,318	2,430	135	59%	73%	32%	21%	9%	5%	0%	0%
Dry Cleaning	1,234	1,436	16	69%	56%	1%	6%	30%	38%	0%	0%

VII.C. Review of Major Legal Actions

Major Cases/Supplemental Environmental Projects

This section provides summary information about major cases that have affected this sector, and a list of Supplemental Environmental Projects (SEPs).

VII.C.1. Review of Major Cases

As indicated in EPA's *Enforcement Accomplishments Report, FY1995 and FY1996* publications, 8 significant enforcement actions were resolved between 1995 and 1996 for the metal casting industry.

EMI Company (Pennsylvania): On May 29, 1996, EPA executed a consent agreement and order settling an administrative action against EMI Company for payment of $20,000 and agreement to perform a Supplemental Environmental Project (SEP). The SEP requires respondent to install and operate (for one (1) year) baghouse emissions control technology for four (4) electric induction furnaces presently not subject to Best Available Control Technology (BAT) control requirements. The total SEP capital costs and operating expenditure costs for one year are estimated to be at least $786,664. Those particulates include some of the regulated materials (copper and manganese) that are the subject of this action. Region III filed the administrative complaint against EMI Company of Erie, Pennsylvania for EPCRA reporting violations.

Leggett and Platt (Grafton, Wisconsin): On Monday, April 1, 1996, a consent decree was entered in the Milwaukee Federal court with Leggett & Platt, concerning their Grafton, WI, facilities (2). A penalty of $450,000 was stipulated in the decree based on four years of reporting failures and exceeding the Federal Pretreatment standards for the Metal Molding and Casting industry. Also, the company agreed in the consent decree not to discharge process wastes to the Grafton POTW. As a result of this stipulation the company started a water recycle system in April, 1995, with several levels of plant water cleanliness. After several months of experimentation the company observed that the recycle system had a two-year payout due to the reduction of the use of plant lubricants. The yearly savings were in excess of $50,000/year. Therefore, there was no economic benefit available for recovery.

Cooper Cameron (Richmond, Texas): This enforcement action arose out of the Region VI Foundry Initiative. EPA conducted an inspection of the Cooper Industries, Inc., Oil Tool Division in Richmond, Texas on September 21-23, 1994. At that facility, the Cooper Oil Tool Division manufactured a

variety of low and high carbon steel and stainless steel oil tool castings for valves and other equipment. During the inspection, EPA discovered a waste pile which contained Electric Arc Furnace (EAF) baghouse dust. This material was sampled using the TCLP method and was found to contain chromium (D007) above the 5.0 mg/L regulatory level. Therefore, the EAF baghouse dust is a hazardous waste. Cooper Oil Tool Division was acquired by Cooper Cameron Corporation which was spun off from Cooper Industries, Inc. in 1995. As the corporate successor to the Oil Tool Division, Cooper Cameron became responsible for the cited violations. Region VI simultaneously filed the consent agreement/consent order on September 30, 1996, assessing a civil penalty of $45,000 plus injunctive relief. Additionally, Cooper Cameron has agreed to remediate, under the Texas Natural Resource Conservation Commision (TNRCC) Voluntary Cleanup Program, approximately 30 acres of waste materials stored in piles on their site. It is estimated that this action will reduce the risk of releasing more than 100 tons of chromium contaminated soil. The agreement to remediate the waste pile is a result of concern over environmental justice. The surrounding community is approximately 51% minority while Texas' average is 39%.

HICA Steel Foundry and Upgrade Co. (Shreveport, Louisiana): On November 7, 1995, EPA issued HICA Steel Foundry and Upgrade Company an administrative order (complaint). The order proposed a $472,000 fine and required closure of several unauthorized hazardous waste management units. This action required the removal and proper disposal of 2,600 gallons on corrosive and ignitable hazardous waste and 255 tons of lead and chromium contaminated waste from the facility.

NIBCO, Inc. (Blytheville, Arkansas): A final consent agreement/consent order was signed by both Region VI and NIBCO on September 30, 1996. NIBCO agreed to pay $750,000 in cash to satisfy the approximately $2.5 million in civil penalties assessed by Region VI in this Foundry Initiative enforcement action. The enforcement action against NIBCO originated because the facility was treating sand used in the casting of metal valves (casting sand) with metallic iron dust, without a permit, and disposing of the material in the Nacogdoches municipal landfill. The casting sand absorbs lead during the casting process, making it a hazardous waste. In order to offset the civil penalty, NIBCO agreed to work with Texas Natural Resource Conservation Commision (TNRCC) and the City of Nacogdoches to characterize the foundry sand waste disposed of in the Nacogdoches municipal landfill, and ensure closure and post-closure measures are performed in accordance with all applicable requirements and schedules established by TNRCC.

Lynchburg Foundry Company (Lynchburg, VA): On August 24, 1995, the Region III Administrator signed a consent order which requires Lynchburg Foundry Company to perform tasks set out in the compliance section of the consent agreement, and to pay $330,000 to EPA. Lynchburg, located in Lynchburg, Virginia, operates two facilities: Radford and Archer Creek, both of which manufacture metal automotive parts. Under the terms of the consent agreement and order, Lynchburg must: 1) list all hazardous wastes handled at both facilities within its hazardous waste notification filed with the Virginia Department of Hazardous Waste; 2) amend or supplement its emergency contingency plans for both facilities to reflect the arrangements agreed to by local emergency services; and 3) permanently cease illegally storing or treating D006 and D008 hazardous wastes in waste piles at either facility.

Great Lakes Casting Corporation (Ludington, MI): On November 15, 1994, a consent decree was entered in the U.S. District Court for the Western District of Michigan in the *U.S. v. Great Lakes Casting Corporation* case requiring Great Lakes to pay a civil penalty of $350,000 for illegal hazardous waste disposal under RCRA.

CMI-Cast Parts, Inc. (Cadillac, MI): A consent agreement and final order was signed on December 22, 1994, which settled an administrative complaint against CMI-Cast Parts, Inc. CMI-Cast Parts, Inc. is a Michigan corporation which owns and operates an iron foundry in Cadillac, Michigan. CMI-Cast Parts, Inc. failed to obtain interim status or a proper operating permit to treat, store or dispose of hazardous waste at its Cadillac facility. From September 1990 to January 1994, the facility failed to comply with the hazardous waste management standards. On January 26, 1995, CMI-Cast Parts, Inc., submitted a certified check in the amount of $454,600.00, payable to the Treasurer of the United States of America, for final settlement of the enforcement action.

VII.C.2. Supplementary Environmental Projects (SEPs)

SEPs are compliance agreements that reduce a facility's non-compliance penalty in return for an environmental project that exceeds the value of the reduction. Often, these projects fund pollution prevention activities that can reduce the future pollutant loadings of a facility. Information on SEP cases can be accessed via the Internet at EPA's Enviroene Website: http://es.inel.gov/sep.

VIII. COMPLIANCE ASSURANCE ACTIVITIES AND INITIATIVES

This section highlights the activities undertaken by this industry sector and public agencies to voluntarily improve the sector's environmental performance. These activities include those initiated independently by industrial trade associations. In this section, the notebook also contains a listing and description of national and regional trade associations.

VIII.A. Sector-related Environmental Programs and Activities

VIII.A.1. Federal Activities

Metalcasting Competitiveness Research (MCR) Program

The U.S. Department of Energy (DOE) Metalcasting Competitiveness Research Act (Public Law 101-425) was signed in 1990 and established the U.S. DOE, Office of Industrial Technology Metalcasting Competitiveness Research (MCR) Program. The program provides assistance to the metalcasting industry by fostering R&D in technology areas that were identified as priority in nature by the industry including technology competitiveness and energy efficiency. In this program, industry and the DOE provide cost-share funding to metalcasting research institutions that conduct the R&D. Projects are chosen based on a set of research priorities developed by the Metalcasting Industrial Advisory Board (IAB). The IAB meets once a year to revise these priorities. As of 1996, 24 projects have been funded through the MCR Program, a number of them having direct and indirect benefits to the environment.

Casting Emission Reduction Program

The Casting Emission Reduction Program (CERP) is primarily focused on developing new materials, processes or equipment for metalcasting manufacturing which will achieve a near-zero effect on the environment while producing high quality components for the U.S. military and other users. The program also has the objective of bridging the critical gap between laboratory and full scale casting production. The result will be a platform for proofing and validating the next generation of light weight weapon system components using near net shape metal castings.

The program was initiated by the Department of Defense (DoD) in response to the rapid reduction in domestic foundries capable of producing the critical components of military hardware. These parts range from tank tracks and turrets to the tail structure of the F-16 fighter. The DoD sees an immediate threat to sand casting foundries and their ability to withstand the changes resulting from the Titles III and V Amendments to the 1990 Clean Air Act.

In addition, DoD realizes that the needs of the military for post year 2000 hardware will depend on manufacturing technologies which do not exist today or are unable to make the transition from the lab bench to the shop floor. CERP aims to provide the country with the ability to launch lighter weight castings more quickly and at the same time meet the more demanding environmental regulations of the 1990 Clean Air Act Amendments. Although the program was initiated to address military needs, it is anticipated that it will benefit the entire industry.

The specific activities of CERP will include obtaining a baseline of emissions from foundries across the U.S., developing a pilot foundry at McClellan AFB in California for the testing and prototyping of new casting processes and materials, and developing the real-time emission instrumentation for foundries. The five-year program receives Congressional appropriations under the Research, Development, Test & Defense Wide category. Other technical partners directly supporting the project include the American Foundrymen's Society, the U.S. Environmental Protection Agency (EPA), the California Air Resources Board (CARB), and the U.S. Council for Automotive Research (USCAR). Contact: Bill Walden, (916) 643-1090.

EPA Region VI Foundry Initiative

EPA's Region VI (Oklahoma, Texas, Louisiana, Arkansas, New Mexico) began a Foundry Initiative in 1993 to improve compliance rates among the 600 foundries in the region. An initial inspection of 27 foundries in the Region indicated that a large percentage had potential RCRA violations. Region VI formed a partnership with the States and the American Foundrymen's Society to develop an initiative for environmental compliance which would be beneficial to foundries. EPA, the States and foundry representatives established a workgroup that provides an open forum for discussion, identifies relevant environmental issues facing foundries and develops educational assistance programs.

Through education and compliance assistance, the program aims to improve communication between the industry and the regulatory agencies and increase voluntary compliance with the regulations. The program provides foundries with information to fix problems before active enforcement occurs. For example, in Oklahoma where the initiative has recently been completed, a six month correction period was offered. Workshops and seminars were held in each state and individual compliance assistance and site visits are being offered. Contact: Joel Dougherty, Ph.D., (214) 665-2281.

VIII.A.2. State Activities

Oklahoma

The Oklahoma Department of Environmental Quality (DEQ) Customer Assistance Program recently completed its Foundry Initiative with EPA Region VI (See above). After Region 6 made plans to inspect 12 facilities in Oklahoma, the Oklahoma (DEQ) suggested an alternate strategy. A multi-media workshop was held in April 1995 that focused on pollution issues facing the foundry industry. From that workshop, an entire state-wide compliance achievement program was developed for metal casting facilities.

The Program consisted of the following trade-offs between industry and the regulators.

1) The industry would perform an environmental self-audit and fix any problems identified.
2) The DEQ and the EPA would allow a six month "correction period."
3) During the correction period any regularly scheduled annual inspections were canceled. This allowed the facility to focus on identifying and correcting areas of non-compliance.
4) At the end of the "correction period" there would be a return to normally scheduled inspections.

Of the 45 qualifying facilities in Oklahoma, 23 participated in the program. Each of the 23 facilities performed a self-audit that covered air quality, water quality, and waste management issues. Each facility also completed the program, which included workshops, self-audits, site visits, and "free" inspections. The types of compliance issues that were corrected as a result of the program were:

1) state minor air permits,
2) solid waste disposal approvals,
3) storm water pollution prevention plans,
4) SARA Title III reporting, and
5) air pollution controls.

An important outcome was the new relationship between the foundries and the agency. This new relationship was based on information sharing for the common goal of compliance. The participating foundries were able to obtain permits and disposal approvals without penalty. Several facilities continue to work with the DEQ to solve more complex compliance issues, such as on-site land disposal of foundry sand. Contact: Dave Dillon, Customer Assistance Program, Oklahoma DEQ, (405) 271-1400.

University of Wisconsin - Milwaukee Center for By-Product Utilization

At the University of Wisconsin - Milwaukee Center for By-Product Utilization researchers are examining the feasibility of using spent foundry sand and slag as feed for concrete manufacturing. The center is testing the compression strengths of concrete mixed with 25 percent and 35 percent (by weight) of different types of used foundry sand. Tests are also being carried out substituting foundry sand in asphaltic concrete. Many of the tests have shown that structural grade concrete and asphaltic concrete can be produced successfully and economically using waste foundry sand.

VIII.B. EPA Voluntary Programs

33/50 Program

The 33/50 Program is a groundbreaking program that has focused on reducing pollution from seventeen high-priority chemicals through voluntary partnerships with industry. The program's name stems from its goals: a 33% reduction in toxic releases by 1992, and a 50% reduction by 1995, against a baseline of 1.5 billion pounds of releases and transfers in 1988. The results have been impressive: 1,300 companies have joined the 33/50 Program (representing over 6,000 facilities) and have reached the national targets a year ahead of schedule. The 33% goal was reached in 1991, and the 50% goal -- a reduction of 745 million pounds of toxic wastes -- was reached in 1994. The 33/50 Program can provide case studies on many of the corporate accomplishments in reducing waste (Contact 33/50 Program Director David Sarokin -- 202-260-6396).

Table 19 lists those companies participating in the 33/50 program that reported four-digit SIC codes within 332 and 336 to TRI. Some of the companies shown also listed facilities that are not producing metal castings. The number of facilities within each company that are participating in the 33/50 program and that report metal casting SIC codes is shown. Where available and quantfiable against 1988 releases and transfers, each company's 33/50 goals for 1995 and the actual total releases and transfers and percent reduction between 1988 and 1994 are presented.

Fourteen of the seventeen target chemicals were reported to TRI by metal casting facilities in 1994. Of all TRI chemicals released and transferred by the metal casting industry, nickel and nickel compounds, and chromium and chromium compounds (both 33/50 target chemicals), were released and transferred second and third most frequently (behind copper), and were in the top ten largest volume released and transferred. Other frequently reported 33/50 target chemicals were lead and lead compounds, xylenes and toluene.

Table 20 shows that 55 companies comprised of 129 facilities reporting SIC 332 and 336 are participating in the 33/50 program. For those companies shown with more than one metal casting facility, all facilities may not be participating in 33/50. The 33/50 goals shown for companies with multiple metal casting facilities, however, are company-wide, potentially aggregating more than one facility and facilities not carrying out metal casting operations. In addition to company-wide goals, individual facilities within a company may have their own 33/50 goals or may be specifically listed as not participating in the 33/50 program. Since the actual percent reductions shown in the last column apply to all of the companies' metal casting facilities and only metal casting facilities, direct comparisons to those company goals incorporating

non-metal casting facilities or excluding certain facilities may not be possible. For information on specific facilities participating in 33/50, contact David Sarokin (202-260-6907) at the 33/50 Program Office.

Table 20: Metal Casting Industry Participation in the 33/50 Program

Parent Company (Headquarters Location)	Company-Owned Metal Casting Facilities Reporting 33/50 Chemicals	Company-Wide % Reduction Goal[1] (1988 to 1995)	1988 TRI Releases and Transfers of 33/50 Chemicals (pounds)[2]	1994 TRI Releases and Transfers of 33/50 Chemicals (pounds)[2]	Actual % Reduction for Metal Casting Facilities (1988-1994)
A B & I Incorporated Oakland, CA	1	98	455,570	345,419	24
Allied-Signal Inc Morristown, NJ	1	50	500	0	100
American Cast Iron Pipe Co Birmingham, AL	3	25	761,209	188,769	75
Ampco Metal Mfg. Inc. Milwaukee, WI	2	*	2,500	12,552	-402
Amsted Industries Incorporated - Chicago, IL	9	66	1,066,730	2,174,300	-104
Armco Inc - Pittsburgh, PA	3	4	74,810	16,480	78
Auburn Foundry Inc Auburn, IN	1	99	592,150	465	100
Bloomfield Foundry Inc Bloomfield, IA	1	***	500	520	-4
Burnham Corporation Lancaster, PA	1	95	99,149	700	99
Cast-Fab Technologies Inc Cincinnati, OH	1	54	24,196	50	100
Caterpillar Inc - Peoria, IL	2	60	24,650	265,815	-978
Chrysler Corporation Auburn Hills, MI	2	80	37,082	18,281	51
Columbia Steel Casting Co Portland, OR	1	*	0	16,801	-
Cooper Industries Inc Houston, TX	4	75	100,873	224,830	-123
Dalton Foundries Inc Warsaw, IN	2	75	594,000	106,996	82
Dana Corporation Toledo, OH	1	**	0	8,860	-
Deere & Company Moline, IL	1	*	161,942	8,337	95
Duriron Company Inc Dayton, OH	1	36	49,725	0	100
Electric Steel Castings Co Indianapolis, IN	1	***	0	0	-

Parent Company (Headquarters Location)	Company-Owned Metal Casting Facilities Reporting 33/50 Chemicals	Company-Wide % Reduction Goal[1] (1988 to 1995)	1988 TRI Releases and Transfers of 33/50 Chemicals (pounds)[2]	1994 TRI Releases and Transfers of 33/50 Chemicals (pounds)[2]	Actual % Reduction for Metal Casting Facilities (1988-1994)
Emerson Electric Co Saint Louis, MO	2	50	0	0	-
Federal-mogul Corporation Southfield, MI	1	50	0	3,455	-
Ford Motor Company Dearborn, MI	1	15	94,478	96,803	-2
Funk Finecast Inc Columbus, OH	1	*	14,290	596	96
General Electric Company Fairfield, CT	1	50	0	195	-
General Motors Corporation Detroit, MI	3	*	676,800	387,813	43
Hartzell Manufacturing Inc Saint Paul, MN	1	85	250	0	100
Hitchiner Manufacturing Co Milford, NH	4	50	91,930	699	99
Hubbell Incorporated Orange, CT	1	***	23,641	0	100
Interlake Corporation Lisle, IL	1	37	8,000	0	100
Jefferson City Mfg Co Inc Jefferson City, MO	1	**	29,500	0	100
Naco Inc - Lisle, IL	7	***	250,920	102,532	59
Navistar Intl Transportation Co - Chicago, IL	2	*	40,500	0	100
Newell Co - Freeport, IL	16	23	1,091,853	149,630	86
Ngk Metals Corp. Temple, PA	1	99	280	2,800	-900
Northern Precision Casting Co - Lake Geneva, WI	1	99	18,583	96	99
Pac Foundries Port Hueneme, CA	1	75	16,950	0	100
Pacific Alloy Castings South Gate, CA	1	**	1,500	2,659	-77
Pechiney Corporation Greenwich, CT	4	***	266,950	24,099	91
PHB Inc - Fairview, PA	1	100	22,292	0	100
Precision Castparts Corp Portland, OR	10	29	584,861	197,377	66
Premark International Inc Deerfield, IL	1	***	0	530	-
Progress Casting Group Inc Minneapolis, MN	1	95	17,412	0	100

Parent Company (Headquarters Location)	Company-Owned Metal Casting Facilities Reporting 33/50 Chemicals	Company-Wide % Reduction Goal[1] (1988 to 1995)	1988 TRI Releases and Transfers of 33/50 Chemicals (pounds)[2]	1994 TRI Releases and Transfers of 33/50 Chemicals (pounds)[2]	Actual % Reduction for Metal Casting Facilities (1988-1994)
Rexcorp U S Inc (Del) Sandwich, IL	1	***	0	274	-
SKF USA Inc King of Prussia, PA	1	***	67,662	0	100
Slyman Industries Inc Medina, OH	1	100	3,858	18,912	-390
Smith Everett Investment Co - Milwaukee, WI	1	89	2,907	1,035	64
Spuncast Inc - Watertown, WI	1	***	0	4	-
SPX Corporation Muskegon, MI	1	2	0	0	-
Sure Cast Inc - Burnet , TX	1	*	0	510	-
Tenneco Inc - Houston , TX	2	8	370,489	0	100
Thyssen Holding Corporation - Troy, MI	3	11	262,300	395,814	-51
Walter Industries Inc Tampa, FL	11	***	1,433,194	536,132	63
Watts Industries Inc North Andover, MA	3	15	97,620	12,070	88
York Mold Inc. Manchester, PA	1	*	500	500	0
Young Corporation Seattle, WA	1	***	0	0	-
TOTAL	129	--	9,535,106	5,323,710	44

Source: U.S. EPA 33/50 Program Office, 1996.

[1] Company-Wide Reduction Goals aggregate all company-owned facilities which may include facilities not producing metal castings.

[2] Releases and Transfers are from metal casting facilities only.

* = Reduction goal not quantifiable against 1988 TRI data.
** = Use reduction goal only.
*** = No numeric reduction goal.

Environmental Leadership Program

The Environmental Leadership Program (ELP) is a national initiative developed by EPA that focuses on improving environmental performance, encouraging voluntary compliance, and building working relationships with stakeholders. EPA initiated a one year pilot program in 1995 by selecting 12 projects at industrial facilities and federal installations which would demonstrate the principles of the ELP program. These principles include: environmental management systems, multimedia compliance assurance, third-party verification of compliance, public measures of accountability, pollution prevention, community involvement, and mentor programs. In return for participating, pilot participants received public recognition and were given a period of time to correct any violations discovered during these experimental projects.

EPA is making plans to launch its full-scale Environmental Leadership Program in 1997. The full-scale program will be facility-based with a 6-year participation cycle. Facilities that meet certain requirements will be eligible to participate, such as having a community outreach/employee involvement programs and an environmental management system (EMS) in place for 2 years. (Contact: http://es.inel.gov/elp or Debby Thomas, ELP Deputy Director, at 202-564-5041)

Project XL

Project XL was initiated in March 1995 as a part of President Clinton's *Reinventing Environmental Regulation* initiative. The projects seek to achieve cost effective environmental benefits by providing participants regulatory flexibility on the condition that they produce greater environmental benefits. EPA and program participants will negotiate and sign a Final Project Agreement, detailing specific environmental objectives that the regulated entity shall satisfy. EPA will provide regulatory flexibility as an incentive for the participants' superior environmental performance. Participants are encouraged to seek stakeholder support from local governments, businesses, and environmental groups. EPA hopes to implement fifty pilot projects in four categories, including industrial facilities, communities, and government facilities regulated by EPA. Applications will be accepted on a rolling basis. For additional information regarding XL projects, including application procedures and criteria, see the May 23, 1995 Federal Register Notice. (Contact: Fax-on-Demand Hotline 202-260-8590, Web: http://www.epa.gov/ProjectXL, or Christopher Knopes at EPA's Office of Policy, Planning and Evaluation 202-260-9298)

Climate Wise Program

Climate Wise is helping US industries turn energy efficiency and pollution prevention into a corporate asset. Supported by the technical assistance, financing information and public recognition that Climate Wise offers, participating companies are developing and launching comprehensive industrial energy efficiency and pollution prevention action plans that save money and protect the environment. The nearly 300 Climate Wise companies expect to save more than $300 million and reduce greenhouse gas emissions by 18 million metric tons of carbon dioxide equivalent by the year 2000. Some of the actions companies are undertaking to achieve these results include: process improvements, boiler and steam system optimization, air compressor system improvements, fuel switching, and waste heat recovery measures including cogeneration. Created as part of the President's Climate Change Action Plan, Climate Wise is jointly operated by the Department of Energy and EPA. Under the Plan many other programs were also launched or upgraded including Green Lights, WasteWi$e and DoE's Motor Challenge Program. Climate Wise provides an umbrella for these programs which encourage company participation by providing information on the range of partnership opportunities available. (Contact: Pamela Herman, EPA, 202-260-4407 or Jan Vernet, DoE, 202-586-4755)

Energy Star Buildings Program

EPA's ENERGY STAR Buildings Program is a voluntary, profit-based program designed to improve the energy-efficiency in commercial and industrial buildings. Expanding the successful Green Lights Program, ENERGY STAR Buildings was launched in 1995. This program relies on a 5-stage strategy designed to maximize energy savings thereby lowering energy bills, improving occupant comfort, and preventing pollution -- all at the same time. If implemented in every commercial and industrial building in the United States, ENERGY STAR Buildings could cut the nation's energy bill by up to $25 billion and prevent up to 35% of carbon dioxide emissions. (This is equivalent to taking 60 million cars of the road). ENERGY STAR Buildings participants include corporations; small and medium sized businesses; local, federal and state governments; non-profit groups; schools; universities; and health care facilities. EPA provides technical and non-technical support including software, workshops, manuals, communication tools, and an information hotline. EPA's Office of Air and Radiation manages the operation of the ENERGY STAR Buildings Program. (Contact: Green Light/Energy Star Hotline at 1-888-STAR-YES or Maria Tikoff Vargas, EPA Program Director at 202-233-9178 or visit the ENERGY STAR Buildings Program website at http://www.epa.gov/appdstar/buildings/)

Green Lights Program

EPA's Green Lights program was initiated in 1991 and has the goal of preventing pollution by encouraging U.S. institutions to use energy-efficient lighting technologies. The program saves money for businesses and organizations and creates a cleaner environment by reducing pollutants released into the atmosphere. The program has over 2,345 participants which include major corporations, small and medium sized businesses, federal, state and local governments, non-profit groups, schools, universities, and health care facilities. Each participant is required to survey their facilities and upgrade lighting wherever it is profitable. As of March 1997, participants had lowered their electric bills by $289 million annually. EPA provides technical assistance to the participants through a decision support software package, workshops and manuals, and an information hotline. EPA's Office of Air and Radiation is responsible for operating the Green Lights Program. (Contact: Green Light/Energy Star Hotline at 1-888-STARYES or Maria Tikoff Vargar, EPA Program Director, at 202-233-9178)

WasteWi$e Program

The WasteWi$e Program was started in 1994 by EPA's Office of Solid Waste and Emergency Response. The program is aimed at reducing municipal solid wastes by promoting waste prevention, recycling collection and the manufacturing and purchase of recycled products. As of 1997, the program had about 500 companies as members, one third of whom are Fortune 1000 corporations. Members agree to identify and implement actions to reduce their solid wastes setting waste reduction goals and providing EPA with yearly progress reports. To member companies, EPA, in turn, provides technical assistance, publications, networking opportunities, and national and regional recognition. (Contact: WasteWi$e Hotline at 1-800-372-9473 or Joanne Oxley, EPA Program Manager, 703-308-0199)

NICE^3

The U.S. Department of Energy is administering a grant program called The National Industrial Competitiveness through Energy, Environment, and Economics (NICE^3). By providing grants of up to 45 percent of the total project cost, the program encourages industry to reduce industrial waste at its source and become more energy-efficient and cost-competitive through waste minimization efforts. Grants are used by industry to design, test, and demonstrate new processes and/or equipment with the potential to reduce pollution and increase energy efficiency. The program is open to all industries; however, priority is given to proposals from participants in the forest products, chemicals, petroleum refining, steel, aluminum, metal casting

and glass manufacturing sectors. (Contact: http//www.oit.doe.gov/access/nice3, Chris Sifri, DOE, 303-275-4723 or Eric Hass, DOE, 303-275-4728)

Design for the Environment (DfE)

DfE is working with several industries to identify cost-effective pollution prevention strategies that reduce risks to workers and the environment. DfE helps businesses compare and evaluate the performance, cost, pollution prevention benefits, and human health and environmental risks associated with existing and alternative technologies. The goal of these projects is to encourage businesses to consider and use cleaner products, processes, and technologies. For more information about the DfE Program, call (202) 260-1678. To obtain copies of DfE materials or for general information about DfE, contact EPA's Pollution Prevention Information Clearinghouse at (202) 260-1023 or visit the DfE Website at http://es.inel.gov/dfe.

VIII.C. Trade Association/Industry Sponsored Activity

VIII.C.1. Industry Research Programs

American Metalcasting Consortium (AMC)

The American Metalcasting Consortium (AMC) is a group of six organizations from the metalcasting industry that have joined together to ally the thousands of small and medium sized metalcasters within the market in an effort to re-establish American viability in the metalcasting industry. AMC aims to energize critical facets of the industry which stimulate lead time and cost reductions, quality, and market share/growth. These goals are being implemented through efforts focused on projects in the areas of 1) applied research and development, 2) education, training, and technology transfer, 3) small business, and 4) casting applications development. Many of the projects will result in positive environmental impacts by improving the industry's overall energy efficiency and reducing the quantity of wastes and off-spec castings. The AMC organizations are: The American Foundrymen's Society (AFS); Non-Ferrous Founders' Society (NFFS); North American Die Casting Association (NADCA); and the Steel Founders' Society of America (SFSA).

Cast Metals Coalition (CMC)

In 1995, Chief Executive Officers and Presidents from the foundry, diecasting, and foundry supply industries developed goals for the future of the industry in *Beyond 2000: A Vision for the American Metalcasting Industry*. Representatives from the American Foundrymen's Society, the Steel Founders' Society of America, and the North American Die Casters Association formed the Cast Metals Coalition (CMC). The CMC is working

towards developing a technology roadmap for pursuing and achieving these goals. CMC is working with industry and research institutions, including universities and national laboratories to develop this roadmap.

Pennsylvania Foundry Consortia

A consortia of Pennsylvania foundries, the Pennsylvania Foundrymen's Association and Penn State University have been working cooperatively since 1985 on issues associated with solid waste disposal, sand reclamation, and beneficial use of foundry residuals. This group is addressing the impediments to beneficial use of foundry residuals on a comprehensive national level. The goals of the research are to maximize the beneficial reuse of environmentally safe foundry residuals and to streamline the path for their acceptability by other industries. Specific tasks carried out involve establishing a database of technical and environmental information to support reuse applications, developing and administering a comprehensive survey of potential aggregate users, and performing physical and environmental testing to demonstrate the applicability of residual wastes for reuse applications. The program receives funding from a U.S. EPA grant.

VIII.C.2. Trade Associations

American Foundrymen's Society, Inc. (AFS)
505 State Street
Des Plaines, IL 60016-8399
Phone: (800) 537-4237
Fax: (847) 824-7848

Members: 12,800
Staff: 60
Contact: Gary Mosher,
Vice President, Environmental Health and Safety

The American Foundrymen's Society (AFS) is the primary trade association for the foundry industry. Founded in 1896, the Society has student and local groups throughout the U.S. and internationally. AFS is the technical, trade, and management association of foundrymen, pattern makers, technologists, and educators. The society sponsors foundry training courses through the Cast Metals Institute on all subjects pertaining to the casting industry and sponsors numerous regional and local conferences and meetings. AFS maintains an extensive Technical Information Center, conducts research programs, compiles statistics, and provides marketing information, environmental services, and testing. The monthly trade magazine, *Modern Casting*, covers current technology practices and other factors affecting the production and marketing of metal castings.

North American Die Casting Association (NADCA)
9701 W. Higgins Rd., Ste. 880
Rosemont, IL 60018
Phone: 847-292-3600
Fax: 847-292-3620

Members: 3,200
Staff: 17
Contact: Dan Twarog

The North American Die Casting Association (NADCA) was founded in 1989 and is made up of producers of die castings and suppliers to industry, product and die designers, metallurgists, and students. There are regional and local groups across the U.S. NADCA develops product standards; compiles trade statistics on metal consumption trends; conducts promotional activities; and provides information on chemistry, mechanics, engineering, and other arts and sciences related to die casting. The association also maintains a library and provides training materials and short, intensive courses in die casting. A trade magazine, *Die Casting Engineer*, is published periodically and contains information on new products and literature, chapter news, and a calendar of events.

Non-Ferrous Founders' Society
455 State St., Suite 100
Des Plaines, IL 60016
Phone: 847-299-0950
Fax: 847-299-3598

Members: 185
Staff: 2
Contact: Jim Mallory or Mark Remlinger, Chair of Environment Committee

The Non-Ferrous Founders' Society (NFFS) is comprised of manufacturers of brass, bronze, aluminum, and other nonferrous castings. Founded in 1943, NFFS conducts research programs and compiles statistics related to the nonferrous castings industry. The Society has committees related to: export government relations; insurance; local management group; management conferences; planning; quality; and technical research. NFFS publishes *The Crucible* bimonthly. This trade magazine contains articles relevant to the day-to-day management of aluminum, brass, bronze, and other nonferrous foundries. NFFS also publishes a biennial *Directory of Nonferrous Foundries* listing member and nonmember foundries producing primarily aluminum, brass, and bronze castings.

Steel Founders' Society of America (SFSA)
Cast Metals Fed. Bldg.
455 State St.
Des Plaines, IL 60016
Phone: 847-299-9160
Fax: 847-299-3105

Members: 75
Staff: 6
Contact: Raymond Monroe

The Steel Founders Society of America (SFSA) is comprised of manufacturers of steel castings. Founded in 1902, the Society conducts research programs and compiles statistics related to the steel casting industry. SFSA periodically publishes *CASTEEL* which contains special articles on specifications and technical aspects of steel castings. SFSA also publishes a biennial *Directory of Steel Foundries* listing steel foundries in the U.S., Canada, and Mexico. Committees include Marketing, Specifications, and Technical Research.

Investment Casting Institute
8350 N. Central Expressway
Suite M 1110
Dallas, TX 75206
Phone: 214-368-8896
Fax: 214-368-8852

Members: 275
Staff: 5
Contact: Henry Bidwell

The Investment Casting Institute is an international trade association comprised of manufacturers of precision castings for industrial use made by the investment (or lost wax) process and suppliers to such manufacturers. The Institute provides training

courses and other specialized education programs and publishes the monthly newsletter *Incast*.

Casting Industry Suppliers Association (CISA)
455 State St., Suite 104
Des Plaines, IL 60016
Phone: 708-824-7878
Fax: 708-824-7908

Members: 66
Staff: 1
Contact: Darla Boudjenah

The Casting Industry Suppliers Association (CISA) was founded in 1986 and represents manufacturers of foundry equipment and supplies such as molding machinery, dust control equipment and systems, blast cleaning machines, tumbling equipment, and related products. CISA also aims to foster better trade practices and serve as an industry representative before the government and the public. The Association also compiles industry statistics and disseminates reports of progress in new processes and methods in foundry operation.

The Ferroalloys Association (TFA)
900 2nd St. NE, Suite 201
Washington, DC 20002
Phone: 202-842-0292
Fax: 202-842-4840

Members: 21
Staff: 3
Contact: Edward Kinghorn Jr.

The purpose of The Ferroalloys Association's (TFA) is to promote the general welfare of the producers of chromium, manganese, silicon, vanadium ferroalloys and related basic alloys/metals in the United States and to engage in all lawful activities to that end. Founded in 1971, TFA consistently provides the ferroalloy industry a means to accomplish tasks through a common bond of business interests.

The ferroalloy industry produces high strength metals created by submerged electric arc smelting, induction melting, alumino/silicothermic reduction processes, and vacuum reduction furnaces, as well as by electrolytic processes. More than 50 different alloys and metals in hundreds of compositions and sizes are produced by the ferroalloy industry for use in the manufacturing of stainless steel, iron, and aluminum. The industry also produces vital materials used in the production of chemicals, semi-conductors, solar cells, coatings, and catalysts.

IX. CONTACTS/ACKNOWLEDGMENTS/RESOURCE MATERIALS

For further information on selected topics within the metal casting industry a list of contacts and publications are provided below.

Contacts[5]

Name	Organization	Telephone	Subject
Jane Engert	EPA/OECA (Office of Enforcement and Compliance Assurance)	202-564-5021	Compliance assistance
James Maysilles	EPA/OAR (Office of Air and Radiation)	919-541-3265	Regulatory requirements (air)
Mary Cunningham	EPA/OSW (Office of Solid Waste)	703-308-8453	Regulatory requirements (RCRA)
Larry Gonzales	EPA/OSW (Office of Solid Waste)	703-308-8468	Regulatory requirements (RCRA) and waste sand treatment
George Jett	EPA/OW (Office of Water), Office of Science and Technology	202-260-7151	Regulatory requirements (water)
Doug Kaempf	DOE (Department of Energy)	202-586-5264	Energy efficiency and technology trends
Bill Walden	Casting Emissions Reduction Program (McClellan AFB, CA)	916-643-1090	Air emissions and casting technologies
Joel Dougherty	EPA/Region VI	214-665-8323	Regulatory requirements pollution prevention
David Byro	EPA/Region III	215-566-5563	Pollution prevention
Dave Dillon	Oklahoma Department of Environmental Quality	405-271-1400	Industrial processes and pollution prevention
Gary Mosher	American Foundrymen's Society Vice President Environmental Health and Safety	800-537-4237	Environment and pollution prevention
Ted Kinghorn Megan Medley	Non-Ferrous Founders' Society	202-842-0219	Regulatory issues
Dan Twarog Tricia Margel	North American Die Casting Association	847-292-3600	Regulatory issues and pollution prevention
Raymond Monroe	Steel Founders Society of America	847-299-9160	Regulatory issues
Bob Voigt	Pennsylvania State University	814-863-7290	Industrial processes

[5] Many of the contacts listed above have provided valuable information and comments during the development of this document. EPA appreciates this support and acknowledges that the individuals listed do not necessarily endorse all statements made within this notebook.

Section II: Introduction to the Metal Casting Industry

LaRue, James P., Ed.D., *Basic Metal Casting*, American Foundrymen's Society, Des Plaines, IL, 1989.

U.S. Industrial Outlook 1994, U.S. Department of Commerce, International Trade Administration, 1995.

1992 Census of Manufacturers Industry Series: Ferrous and Nonferrous Foundries, Department of Commerce, Bureau of the Census, 1996.

Trends Effecting [sic] *R&D in the Metalcasting Industry*, U.S. Department of Energy, Office of Industrial Technologies, Washington, D.C., March 1996.

Kirgin, Kenneth H., *1990s Provide Stability for Ferrous Foundries, Part 1*, Modern Casting, American Foundrymen's Society, Des Plaines, IL, vol. 86 no. 8, August 1995. pp35-37.

Beyond 2000: A Vision for the American Metalcasting Industry, Cast Metals Coalition, September, 1995.

Walden, William C., *Casting Emissions Reduction Program (CERP) Primer*, U.S. Department of Defense, September, 1995.

Rost, John E., *Rebound in Casting Markets Bodes Well for U.S. Foundries*, Modern Casting, American Foundrymen's Society, Des Plaines, IL, vol. 82 no. 1, January 1992. pp29-31.

Loper, Carl R. Jr., *Foundry Practice and Equipment*, Mark's Standard Handbook for Mechanical Engineers, 8th ed., McGraw Hill, 1985. pp. 13-2 - 13-9.

Kunsman, C.D., and Carlson, C.C., *NonFerrous Metals*, Mark's Standard Handbook for Mechanical Engineers, 8th ed., McGraw Hill, 1985. pp. 6-59 - 6-89.

Kirgin, Kenneth H., *Slowing Economy Lowers Casting Demand*, Modern Casting, American Foundrymen's Society, Des Plaines, IL, vol. 85 no. 6, June 1994. p70.

Kirgin, Kenneth H., *Forecast Remains Bullish for '95*, Modern Casting, American Foundrymen's Society, Des Plaines, IL, vol. 85 no. 3, March 1995. p51.

Kirgin, Kenneth H., *Continued Slowdown in '96 Could Lower Casting Shipments 7%*, Modern Casting, American Foundrymen's Society, Des Plaines, IL, vol. 85 no. 9, September 1995. p54.

Section III: Industrial Process Description

LaRue, James P., Ed.D., *Basic Metal Casting*, American Foundrymen's Society, Des Plaines, IL, 1981.

Metal Casting and Molding Processes, ed. Kotzin, Ezra L., American Foundrymen's Society, Des Plaines, IL, 1981.

Kotzin, Ezra L., *Steel Foundries: Air Pollution Engineering Manual*, ed. Buonicore, Anthony J. and Davis, Wayne T., Air and Waste Management Association, Van Nostrand Reinhold, New York, 1992. pp. 733-738.

Scott, Bruce, *Sulfur: Air Pollution Engineering Manual*, ed. Buonicore, Anthony J. and Davis, Wayne T., Air and Waste Management Association, Van Nostrand Reinhold, New York, 1992. pp. 476-477.

Licht, Charles A., *Secondary Brass and Bronze Melting Processes: Air Pollution Engineering Manual*, ed. Buonicore, Anthony J. and Davis, Wayne T., Air and Waste Management Association, Van Nostrand Reinhold, New York, 1992. pp. 733-738.

Leidel, Dieter S., *Pollution Prevention and Foundries*, from Industrial Pollution Prevention Handbook, ed. Freeman, Harry M., McGraw-Hill, Inc., New York, 1995. pp. 667-684.

Profile of the Fabricated Metal Products Industry, Sector Notebook Project, U.S. EPA Office of Compliance, Washington D.C., September 1995. (EPA-310-R-95-007)

Pretreatment of Industrial Wastes, Manual of Practice No. FD-3, Water Environment Federation, Alexandria, Virginia, 1994.

American Foundrymen's Society Air Quality Committee, *Iron Foundries: Air Pollution Engineering Manual*, ed. Buonicore, Anthony J. and Davis, Wayne T., Air and Waste Management Association, Van Nostrand Reinhold, New York, 1992. pp. 719-723.

Summary of Factors Affecting Compliance by Ferrous Foundries, Volume I - Text, Final Report, U.S. EPA, Office of General Enforcement, Washington D.C., January 1981. (EPA-340/1-80-020)

Allsop, D. F., and Kennedy, D., *Pressure Diecasting*, Pergamon Press, Oxford, 1983.

Kaye, Alan, and Street, Arthur, *Die Casting Metallurgy*, Butterworth Scientific, London, 1982.

Street, Arthur, *The Diecasting Book*, Portcullis Press Ltd., Surrey, U.K., 1977.

Form R Reporting of Binder Chemicals Used in Foundries, American Foundrymen's Society, Des Plaines, IL, and Casting Industry Suppliers Association, Worthington, OH, 1992.

Competitive Assessment of the U.S. Foundry Industry, U.S. International Trade Commission, Washington, D.C., 1984. (USITC Publication 1582)

Twarog, Daniel L., and University of Alabama, W*aste Management Study of Foundries Major Waste Streams: Phase I*, Hazardous Waste Research and Information Center, Champaign, IL, January 1993. (HWRIC TR-011)

McKinley, Marvin D., et al., W*aste Management Study of Foundries Major Waste Streams: Phase II*, Hazardous Waste Research and Information Center, Champaign, IL, April 1994. (HWRIC TR-016)

AP-42 Sections 7.13: Steel Foundries and 7.10: Gray Iron Foundries, U.S. EPA Office of Air and Radiation, October 1986.

Section IV: Chemical Release and Transfer Profile

1994 Toxics Release Inventory Public Data Release, U.S. EPA Office of Pollution Prevention and Toxics, June 1996. (EPA 745-R-96-002)

Section V: Pollution Prevention Opportunities

Guides to Pollution Prevention, The Metal Casting and Heat Treating Industry, U.S. EPA, Office of Research and Development, Cincinnati, OH, September 1992. (EPA/625/R-92/009)

Foundry Sand Beneficial Reuse Manual, Special Report, ed. Thomas, Susan P., American Foundrymen's Society, Des Plaines, IL, 1996.

Philbin, Matthew L., *Sand Reclamation Equipment Users Answer the Questions*, Modern Casting, American Foundrymen's Society, Des Plaines, IL, vol. 86 no. 8, August 1996. pp22-26.

Leidel, Dieter S., *Pollution Prevention and Foundries*, from Industrial Pollution Prevention Handbook, ed. Freeman, Harry M., McGraw-Hill, Inc., New York, 1995. pp. 667-684.

Pollution Prevention Practices for the Die Casting Industry, North American Die Casting Association, Rosemont, IL, 1996.

Personal Correspondence with Ms. Suzanne Simoni, Pennsylvania Department of Environmental Protection, Office of Pollution Prevention and Compliance Assistance, Conshohocken, PA, November 1996.

U.S. EPA Enviroene website, http://www.portfolio/epa/environet/ncpd/auscase_ studies /mason.html, 1996.

Twarog, Daniel L., and University of Alabama, W*aste Management Study of Foundries Major Waste Streams: Phase I*, Hazardous Waste Research and Information Center, Champaign, IL, January 1993. (HWRIC TR-011)

McKinley, Marvin D., et al., W*aste Management Study of Foundries Major Waste Streams: Phase II*, Hazardous Waste Research and Information Center, Champaign, IL, April 1994. (HWRIC TR-016)

Archer, Hugh V., et al., *Foundry Calculates the Value of Pollution Prevention*, Water Environment and Technology, vol. 6, no. 6, June, 1994.

Estes, John M., *Energy Cutting Can Give Foundries Real Savings*, Modern Casting, American Foundrymen's Society, Des Plaines, IL, vol. 84, no. 11, November 1994.

Binczewski, George J., *Aluminum Casting and Energy Conservation*, Light Metal Age, vol. 51, no. 11-12, December 1993.

Profile of the Iron and Steel Industry, U.S. EPA Office of Compliance, Washington D.C., 1995.

Section VI: Summary of Applicable Federal Statutes and Regulations

Transactions of the American Foundrymen's Society, Proceedings of the Ninety-Ninth Annual Meeting, April 23-26, 1995, American Foundrymen's Society, Des Plaines, IL, vol.103.

Lessiter, Michael J., *Foundries Prepare for Clean Air Act's Title V Showdown*, Modern Casting, American Foundrymen's Society, Des Plaines, IL, November 1994. pp. 58-59.

Title V Air Operating Permits: What They Mean for Foundries, Modern Casting, American Foundrymen's Society, Des Plaines, IL, vol. 85, no. 1, February 1995. pp. 52-53.

Kwan, Quon Y., and Kaempf, Douglas E., *Environmental Compliance in Metalcasting, Part 1*, Foundry Management and Technology, pg. 42, October 1995.

Kwan, Quon Y., and CEMF, Douglas E., *Environmental Compliance in Metalcasting, Part 2*, Foundry Management and Technology, pg. 39, November 1995.

Breen, Barry, and Campbell-Mohn, Celia, *Sustainable Environmental Law, Chapter 16: Metals*, Environmental Law Institute, West Publishing Co., St. Paul, MN, 1993.

Section VIII: Compliance Activities and Initiatives

American Metalcasting Consortium, http://www.scra.org/amc/, 1996.

U.S. EPA Enviroene website, http://www.portfolio/epa/environet/ncpd/auscase_studies/mason.html, 1996.

Beyond 2000: A Vision for the American Metalcasting Industry, Cast Metals Coalition, September, 1995.

Personal Correspondence with Mr. David Byro, U.S. EPA, Region III, Philadelphia, PA, June 1996.

Personal Correspondence with Joel Dougherty, Ph.D., U.S. EPA, Region 6, Hazardous Waste Enforcement Branch, Dallas, TX, October 1996.

Personal Correspondence with Mr. Bill Walden, U.S. Department of Defense, McClellan AFB, CA, June 1996.

Personal Correspondence with Ms. Kathy Martin, Oklahoma Department of Environmental Quality, Oklahoma City, OK, September 1996.

Personal Correspondence with Ms. Suzanne Simoni, Pennsylvania Department of Environmental Protection, Office of Pollution Prevention and Compliance Assistance, Conshohocken, PA, November 1996.

Personal Correspondence with Mr. Douglas Kaempf, U.S. Department of Energy, Industries of the Future, Washington, D.C., July 1996.